

CLAIMS

We Claim:

1. A vector comprising:
 - 5 a) a transposase gene operably linked to a first promoter; and
 - b) one or more genes of interest operably-linked to one or more additional promoters;
 - c) wherein the one or more genes of interest and their operably-linked promoters are flanked by transposase insertion sequences recognized by
10 the transposase; and
 - d) wherein the first promoter comprises a modified Kozak sequence comprising ACCATG.
- 15 2. The vector of claim 1, wherein one to twenty codons at a beginning of the transposase gene are modified by changing a nucleotide at a third base position of the codon to an adenine or thymine without modifying the amino acid encoded by the codon.
- 20 3. The vector of claim 2, wherein the transposase gene is modified in its first ten codons.
4. The vector of claim 1, wherein the transposase is a Tn10 transposase.
- 25 5. The vector of claim 1, wherein the first promoter is a constitutive promoter.
6. The vector of claim 1, wherein the first promoter is an inducible promoter.
- 30 7. The vector of claim 6, wherein the inducible promoter is an ovalbumin promoter or a vitellogenin promoter.
8. The vector of claim 1, wherein one gene of interest is operably-linked to a second promoter.
- 35 9. The vector of claim 8, wherein the second promoter is a constitutive promoter.

10. The vector of claim 8, wherein the second promoter is an inducible promoter.
- 5 11. The vector of claim 10, wherein the inducible promoter is an ovalbumin promoter or a vitellogenin promoter.
12. The vector of claim 1, further comprising a polyA sequence operably-linked to the transposase gene.
- 10 13. The vector of claim 12, wherein the polyA sequence is a conalbumin polyA sequence.
14. The vector of claim 1 or claim 12, further comprising two stop codons operably-linked to the transposase gene.
- 15 15. The vector of claim 1, wherein a first gene of interest is operably-linked to a second promoter and a second gene of interest is operably-linked to a third promoter.
- 20 16. The vector of claim 1, wherein a first and a second gene of interest are operably-linked to a second promoter.
17. The vector of claim 1, further comprising an enhancer operably-linked to the one or more genes of interest.
- 25 18. The vector of claim 17, wherein the enhancer comprises at least a portion of an ovalbumin enhancer.
19. The vector of claim 1, further comprising an egg directing sequence operably-linked to the one or more genes of interest.
- 30 20. The vector of claim 19, wherein the egg directing sequence is an ovalbumin signal sequence or an ovomucoid signal sequence.
- 35 21. The vector of claim 19, wherein the egg directing sequence is a vitellogenin targeting sequence.

22. A method for producing a transgenic animal comprising administering to the animal a vector comprising:
- a) a modified transposase gene operably linked to a first promoter; and
 - b) one or more genes of interest operably-linked to one or more additional promoters;
 - c) wherein the one or more genes of interest and their operably-linked promoters are flanked by transposase insertion sequences recognized by the transposase; and
 - d) wherein the first promoter comprises a modified Kozak sequence comprising ACCATG.
23. The method of claim 22, wherein one to twenty codons at a beginning of the transposase gene are modified by changing a nucleotide at a third base position of the codon to an adenine or thymine without modifying the amino acid encoded by the codon.
24. The method of claim 23, wherein the transposase gene is modified in its first ten codons.
25. The method of claim 22, wherein the vector is administered via an intratesticular, intraarterial, intraoviductal or intraembryonic route.
26. The method of claim 22, wherein the transposase is a Tn10 transposase.
27. The method of claim 22, wherein the first promoter is a constitutive promoter.
28. The method of claim 22, wherein the first promoter is an inducible promoter.
29. The method of claim 28, wherein the inducible promoter is selected from the group consisting of an ovalbumin promoter, an ovomucoid promoter and a vitellogenin promoter.
30. The method of claim 22, wherein one gene of interest is operably linked to a second promoter.

31. The method of claim 30, wherein the second promoter is an inducible promoter.
- 5 32. The method of claim 31, wherein the inducible promoter is an ovalbumin promoter or a vitellogenin promoter.
33. The method of claim 22, wherein the vector further comprises a polyA sequence operably-linked to the transposase gene.
- 10 34. The method of claim 33, wherein the polyA sequence is a conalbumin polyA sequence.
35. The method of claim 22 or claim 33, wherein the vector further comprises two stop codons operably-linked to the transposase gene.
- 15 36. The method of claim 22, wherein a first gene of interest is operably-linked to a second promoter and a second gene of interest is operably-linked to a third promoter.
- 20 37. The method of claim 22, wherein a first and second gene of interest are operably linked to a second promoter.
38. The method of claim 22, further comprising an enhancer operably-linked to the one or more genes of interest.
- 25 39. The method of claim 38, wherein the enhancer comprises at least a portion of an ovalbumin enhancer.
- 30 40. The method of claim 22, wherein the animal is an avian animal.
41. The method of claim 40, wherein the avian animal is a chicken or a quail.
- 35 42. An egg produced by the avian animal of claim 40, wherein the egg contains one or more desired proteins encoded by the one or more genes of interest.

43. A transgenic sperm produced by the animal of claim 22.
44. A method of producing a desired protein comprising:
- a) administering to an animal a vector comprising a modified transposase gene operably linked to a first promoter, and a gene of interest encoding the desired protein operably-linked to a second promoter; and
 - b) isolating the desired protein produced in the animal; wherein
 - c) the gene of interest and its operably-linked promoter are flanked by transposase insertion sequences recognized by the transposase; and
 - d) the first promoter comprises a modified Kozak sequence comprising ACCATG.
45. The method of claim 44, wherein one to twenty codons at a beginning of the transposase gene are modified by changing a nucleotide at a third base position of the codon to an adenine or thymine without modifying the amino acid encoded by the codon.
46. The method of claim 44, wherein the animal is an egg-laying animal and the desired protein is isolated from an egg white.
47. The method of claim 44, wherein the vector further comprises a TAG sequence and wherein the desired protein is purified using the TAG sequence.
48. The method of claim 47, wherein the TAG sequence comprises a polynucleotide sequence encoding an antigenic portion of a gp41 protein, an enterokinase cleavage site and a spacer polynucleotide sequence.
49. The method of claim 47, wherein the TAG sequence comprises a polynucleotide sequence shown in SEQ ID NO:22.
50. The method of claim 44, wherein the desired protein is a lytic protein.
51. The method of claim 44, wherein the vector further comprises a second gene of interest operably-linked to a third promoter and wherein the genes of interest encode antibody polypeptides.